Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

1. (Currently Amended) An optical wavelength division multiplexing access system, comprising a center node (OSU) and n optical network units (ONUs) arranged by using a W-MULDEM unit, a multiplexing section between the OSU and the W-MULDEM unit established by extending a current-use optical fiber and a redundant optical fiber and access sections between the W-MULDEM unit and the individual ONUs established by the extension of optical fibers, wherein downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed using wavelengths that are allocated to individual ONUs and the resultant signals are transmitted across the multiplexing section, and wherein the W-MULDEM unit performs wavelength multiplexing or wavelength demultiplexing for the upstream or downstream optical signals to provide bidirectional transmission,

the OSU includes:

a transmission device for multiplexing downstream optical signals having wavelengths λd1 to λdn that correspond to the ONUs and transmitted to the ONUs along the current-use optical fiber, for multiplexing downstream optical signals having wavelengths λd1+Δλ to λdn+Δλ that correspond to the ONUs and transmitted to the ONUs along the redundant optical fiber, and for selecting either the current-use optical fiber or the redundant optical fiber for transmission, and

a reception device for receiving upstream optical signals having wavelengths λu1 to λun along the current-use optical fiber or for receiving upstream optical signals having wavelengths λu1+Δλ to λun+Δλ along the redundant optical fiber;

the individual ONUs receive corresponding downstream optical signals having wavelengths λd1 to λdn or corresponding downstream optical signals having wavelengths λd1+Δλ to λdn+Δλ, which are received along the optical fibers extended across the access sections, the individual ONUs transmit, to the optical fibers extended across the access sections, corresponding upstream optical signals that have wavelengths λu1 to λun and transmitted along the current-use optical fiber extended across the multiplexing section, or corresponding upstream optical signals that have wavelengths λu1+Δλto λun+Δλ and transmitted along the redundant optical fiber;

the W-MULDEM unit includes an array waveguide diffraction grating (AWG) having two ports, respectively connected to the current-use optical fiber and the redundant optical fiber, and n ports, connected to optical fibers corresponding to the ONUs;

the W-MULDEM unit demultiplexes to the ports corresponding to the ONUs the downstream optical signals that have wavelengths λd1 to λdn and are received along the current-use optical fiber, or the downstream optical signals that have wavelengths λd1+Δλ to λdn+Δλ and are received along the redundant optical fiber, or multiplexes, to the port corresponding to the current-use optical fiber or the redundant optical fiber, the upstream optical signals that have wavelengths λu1 to λun or wavelengths λu1+Δλ to λun+Δλ and that are received along the optical fibers corresponding to the ONUs;

a wavelength difference between the downstream optical signal and the upstream optical signal corresponding to each of the ONUs is integer times a free spectrum range (FSR) of the AWG; ~~and~~

the two ports of the AWG are provided at locations consonant with a wavelength difference (Δλ) between optical signals transmitted along the current-use optical fiber and optical signals transmitted along the redundant optical fiber corresponding to each of the ONUs; and

wherein the transmission device includes:

a switching device for changing from a current-use optical fiber to a redundant optical fiber;

a supervisory light source for outputting current-use fiber supervisory light and reserve fiber supervisory light having wavelengths λs0 and λs1 that differ from the wavelengths of the upstream optical signals and the downstream optical signals;

a supervisory control unit, for detecting the supervisory light having wavelengths λs0 and λs1 that is received along the current-use optical fiber and the redundant optical fiber, and outputting a selection signal to the switching device to change from the current-use optical fiber to the redundant optical fiber;

a multiplexing unit, for multiplexing the current-use fiber supervisory light having wavelength λs0 and an optical signal transmitted along the current-use optical fiber;

a demultiplexing unit, for demultiplexing the current-use fiber supervisory light having wavelength λs0 from an optical signal transmitted along the current-use optical fiber;

a multiplexing unit, for multiplexing the reserve fiber supervisory light having wavelength λs1 and an optical signal transmitted along the redundant optical fiber; and

a demultiplexing unit, for demultiplexing the reserve fiber supervisory light having wavelength λs1 from an optical signal transmitted along the redundant optical fiber.

2. (Cancelled)

3. (Previously Presented) The optical wavelength division multiplexing access system according to claim 1, wherein:

when λd1, λd2, . . . and λdn are defined as wavelengths of downstream optical signals that are transferred along the current-optical fiber and correspond to the ONUs, and when a wavelength interval is a constant, defining λd1+k, λd2+k, . . . and λdn+k ($1 \leqq k < n$) as wavelengths of downstream optical signals that are transferred along the redundant optical fiber to the ONUs, and

when λu1, λu2, . . . and λun are defined as wavelengths of upstream optical signals that are transferred along the current-optical fiber and correspond to the ONUs, and when a wavelength interval is a constant, defining λu1+k, λu2+k, . . . and λun+k (k is an integer of one or greater) as wavelengths of upstream optical signals that are transferred along the redundant optical fiber to the ONUs.

4. (Previously Presented) The optical wavelength division multiplexing access system according to claim 3, wherein:

replacing λdn + i with λdi when λdn + i = λdi + FSR is established; and

replacing $\lambda un + i$ with λui when $\lambda un + i = \lambda ui + FSR$ is established (i is an integer of 1 to k).

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Currently Amended) The optical wavelength division multiplexing access system according to claim [[2]] 1, wherein, under a condition that current-use optical receivers are in normal state, when the current-use fiber supervisory light having wavelength $\lambda s0$ is not detected and the reserve fiber supervisory light having wavelength $\lambda s1$ is detected, or when the current-use fiber supervisory light having wavelength $\lambda s0$ is not detected and the reserve fiber supervisory light having wavelength $\lambda s1$ is also not detected, and when the upstream optical receivers of the OSU do not receive upstream optical signals, the supervisory control unit transmits a selection signal to perform communication using the redundant optical fiber.

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Currently Amended) ~~The~~ An optical wavelength division multiplexing access system ~~according to claim 12, wherein~~, whereby a center node (OSU) and n optical network units (ONUs) are arranged through a W-MULDEM unit, whereby a multiplexing section between the OSU and the W-MULDEM unit is established by extending a current-use downstream optical fiber, a current-use upstream optical fiber, a reserve downstream optical fiber and a reserve upstream optical fiber and access sections between the W-MULDEM unit and the individual ONUs are established by extension of downstream optical fibers and of upstream optical fibers, whereby downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed, using wavelengths that are allocated to the individual ONUs, and resultant optical signals are transmitted across the multiplexing section, and whereby the W-MULDEM unit performs either wavelength multiplexing or wavelength division for the upstream or downstream optical signals to provide bidirectional transmission,

wherein the OSU includes:

a transmission device for multiplexing downstream optical signals having wavelengths λd1 to λdn that correspond to the ONUs and that are to be transmitted to the ONUs along the current-use downstream optical fiber, for multiplexing downstream optical signals having wavelengths λd1+Δλd to λdn+Δλd that correspond to the ONUs and that are to be transmitted to the ONUs along the reserve downstream optical fiber, and for selecting either the current-use downstream optical fiber or the reserve downstream optical fiber used for transmission, and

receivers for receiving upstream optical signals having wavelengths λu1 to λun transmitted along the current-use upstream optical fiber, or for receiving upstream optical signals having wavelengths λu1+Δλu to λun+Δλu transmitted along the reserve upstream optical fiber;

the ONUs receive, along the optical fibers extended across the access sections, corresponding downstream optical signals having wavelengths λd1 to λdn or corresponding downstream optical signals having wavelengths λd1+Δλd to λdn+Δλd, the ONUs transmit, to the optical fibers extended across the access sections, corresponding upstream optical signals that have wavelengths λu1 to λun and that are to be transmitted along the current-use optical fiber extended across the multiplexing section, or corresponding upstream optical signals that have wavelengths λu1+Δλu to λun+Δλu and are to be transmitted along the redundant optical fiber;

the W-MULDEM unit includes:

a downstream array waveguide diffraction grating (downstream AWG) having two ports, which are to be respectively connected to the current-use downstream optical fiber and the reserve downstream optical fiber, and n ports, which are to be connected to optical fibers corresponding to the ONUs, and

an upstream array waveguide diffraction grating (upstream AWG) having two ports, which are to be respectively connected to the current-use upstream optical fiber and the reserve upstream optical fiber, and n ports, which are connected to the optical fibers corresponding to the ONUs;

the W-MULDEM unit demultiplexes to the ports of the downstream AWG that correspond to the ONUs the downstream optical signals that have wavelengths λd1 to

λdn and are received along the current-use downstream optical fiber, or the downstream optical signals that have wavelengths λd1+Δλd to λdn+Δλd and are received along the reserve downstream optical fiber, or multiplexes, to the port corresponding to the current-use upstream optical fiber or the reserve upstream optical fiber, the upstream optical signals that have wavelengths λu1 to λun or wavelengths λu1+Δλu to λun+Δλu and that are transmitted to the upstream AWG along the optical fibers corresponding to the ONUs;

the two ports of the downstream AWG are provided at locations consonant with a wavelength difference (Δλd) between optical signals transmitted along the current-use downstream optical fiber and optical signals transmitted along the redundant downstream optical fiber corresponding to each of the ONUs and the two ports of the upstream AWG are provided at locations consonant with a wavelength difference (Δλu) between optical signals transmitted along the current-use upstream optical fiber and optical signals transmitted along the redundant upstream optical fiber corresponding to each of the ONUs; and

the transmission device includes:

a switching device for changing from the upstream (or downstream) current-use optical fiber to the upstream (or downstream) redundant optical fiber,

a supervisory light source for outputting a current-use fiber supervisory light and a reserve fiber supervisory light having wavelengths λs0 and λs1 that differ from wavelengths of the upstream optical signals and the downstream optical signals,

a supervisory control unit, for detecting the supervisory lights having wavelengths λs0 and λs1 that are received along the upstream current-use fiber and the

upstream reserve fiber, and for outputting a selection signal to the switching device to change from the upstream (or downstream) current-use fiber to the upstream (or downstream) reserve fiber,

a multiplexing unit, for multiplexing the current-use fiber supervisory light having wavelength λs0 and an optical signal transmitted along the downstream (or upstream) current-use optical fiber,

a demultiplexing unit, for demultiplexing the current-use fiber supervisory light having wavelength λs0 from an optical signal transmitted along the upstream (or downstream) current-use optical fiber,

a multiplexing unit, for multiplexing the reserve fiber supervisory light having wavelength λs1 and an optical signal transmitted along the downstream (or upstream) redundant optical fiber, and

a demultiplexing unit, for demultiplexing the reserve fiber supervisory light having wavelength λs1 from an optical signal transmitted along the upstream (or downstream) redundant optical fiber; and

the W-MULDEM unit includes:

a demultiplexing unit, for demultiplexing the current-use optical fiber supervisory light having wavelength λs0, which has been multiplexed with the optical signal and has been received along the downstream (or upstream) current-use optical fiber,

a multiplexing unit, for re-multiplexing the current-use optical fiber supervisory light having wavelength λs0 and an optical signal transmitted along the upstream (or downstream) current-use optical fiber,

a demultiplexing unit, for demultiplexing the redundant optical fiber supervisory light having wavelength λs1 that has been multiplexed with an optical signal and received along the downstream (or upstream) redundant optical fiber, and

a multiplexing unit, for re-multiplexing the redundant optical fiber supervisory light having wavelength λs1 and an optical signal transmitted along the upstream (or downstream) optical fiber.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein, under a condition that current-use optical receivers are in the normal state, when the current-use fiber supervisory light having wavelength λs0 is not detected and the reserve fiber supervisory light having wavelength λs1 is detected, or when the current-use fiber supervisory light having wavelength λs0 is not detected and the reserve fiber supervisory light having wavelength λs1 is also not detected, and when the upstream optical receivers of the OSC do not receive upstream optical signals, the supervisory control unit transmits a selection signal to perform communication using the redundant optical fiber.

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Currently Amended) ~~The~~ An optical wavelength division multiplexing access system ~~according to claim 12~~, whereby a center node (OSU) and n optical network units (ONUs) are arranged through a W-MULDEM unit, whereby a multiplexing section between the OSU and the W-MULDEM unit is established by extending a current-use downstream optical fiber, a current-use upstream optical fiber, a reserve downstream optical fiber and a reserve upstream optical fiber and access sections between the W-MULDEM unit and the individual ONUs are established by extension of downstream optical fibers and of upstream optical fibers, whereby downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed, using wavelengths that are allocated to the individual ONUs, and resultant optical signals are transmitted across the multiplexing section, and whereby the W-MULDEM unit performs either wavelength multiplexing or wavelength division for the upstream or downstream optical signals to provide bidirectional transmission,

wherein the OSU includes:

a transmission device for multiplexing downstream optical signals having wavelengths λd1 to λdn that correspond to the ONUs and that are to be transmitted to the ONUs along the current-use downstream optical fiber, for multiplexing downstream

optical signals having wavelengths λd1+Δλd to λdn+Δλd that correspond to the ONUs and that are to be transmitted to the ONUs along the reserve downstream optical fiber, and for selecting either the current-use downstream optical fiber or the reserve downstream optical fiber used for transmission, and

receivers for receiving upstream optical signals having wavelengths λu1 to λun transmitted along the current-use upstream optical fiber, or for receiving upstream optical signals having wavelengths λu1+Δλu to λun+Δλu transmitted along the reserve upstream optical fiber;

the ONUs receive, along the optical fibers extended across the access sections, corresponding downstream optical signals having wavelengths λd1 to λdn or corresponding downstream optical signals having wavelengths λd1+Δλd to λdn+Δλd, the ONUs transmit, to the optical fibers extended across the access sections, corresponding upstream optical signals that have wavelengths λu1 to λun and that are to be transmitted along the current-use optical fiber extended across the multiplexing section, or corresponding upstream optical signals that have wavelengths λu1+Δλu to λun+Δλu and are to be transmitted along the redundant optical fiber;

the W-MULDEM unit includes:

a downstream array waveguide diffraction grating (downstream AWG) having two ports, which are to be respectively connected to the current-use downstream optical fiber and the reserve downstream optical fiber, and n ports, which are to be connected to optical fibers corresponding to the ONUs, and

an upstream array waveguide diffraction grating (upstream AWG) having two ports, which are to be respectively connected to the current-use upstream optical

fiber and the reserve upstream optical fiber, and n ports, which are connected to the optical fibers corresponding to the ONUs;

the W-MULDEM unit demultiplexes to the ports of the downstream AWG that correspond to the ONUs the downstream optical signals that have wavelengths λd1 to λdn and are received along the current-use downstream optical fiber, or the downstream optical signals that have wavelengths λd1+Δλd to λdn+Δλd and are received along the reserve downstream optical fiber, or multiplexes, to the port corresponding to the current-use upstream optical fiber or the reserve upstream optical fiber, the upstream optical signals that have wavelengths λu1 to λun or wavelengths λu1+Δλu to λun+Δλu and that are transmitted to the upstream AWG along the optical fibers corresponding to the ONUs;

the two ports of the downstream AWG are provided at locations consonant with a wavelength difference (Δλd) between optical signals transmitted along the current-use downstream optical fiber and optical signals transmitted along the redundant downstream optical fiber corresponding to each of the ONUs and the two ports of the upstream AWG are provided at locations consonant with a wavelength difference (Δλu) between optical signals transmitted along the current-use upstream optical fiber and optical signals transmitted along the redundant upstream optical fiber corresponding to each of the ONUs;

wherein the OSU further comprises:

a device for oscillating optical carriers having wavelengths λu1 to λun, which are used for upstream signals, so as to permit the ONUs to generate upstream

optical signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream current-use optical fiber, and

a device for oscillating optical carriers having wavelengths λu1+Δλu to λun+Δλu, which are used for upstream signals, so as to permit the ONUs to generate upstream optical signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream redundant optical fiber;

the W-MULDEM unit includes, in addition to the downstream AWG and the upstream AWG,

two wavelength group demultiplex filters, for demultiplexing downstream optical signals having wavelengths λd1 to λdn, which are received along the downstream current-use optical fiber from the optical carriers having wavelengths λu1 to λun that are used for upstream signals, and for demultiplexing the downstream optical signals having wavelengths λd1+Δλd to λdn+Δλd, which are received, along the downstream redundant optical fiber, from the optical carriers having wavelengths λu1+Δλu to λun+Δλu that are used for upstream signals,

an upstream signal optical carrier AWG, for routing the optical carriers having wavelengths λu1 to λun, used for upstream signals, to ports corresponding to the ONUs, and

n wavelength group coupling filters, for multiplexing the downstream optical signals that are sorted by the downstream AWG and the optical carriers, used for upstream signals, that are sorted by the upstream signal optical carrier AWG, and transmitting the resultant signals to the downstream optical fibers that correspond to the ONUs;

the ONUs are so constituted as to modulate corresponding optical carriers, used for upstream signals, from among those that are received while multiplexed with the downstream optical signals, and to transmit the obtained signals as upstream optical signals having wavelengths $\lambda u1$ to λun, or wavelengths $\lambda u1+\Delta\lambda u$ to $\lambda un+\Delta\lambda u$.

26. (Previously Presented) The optical wavelength division multiplexing access system according to claim 25, wherein,

when $\lambda d1$, $\lambda d2$, . . . and λdn are defined as wavelengths of downstream optical signals that are transferred along the current-optical fiber and correspond to the ONUs, and when a wavelength interval is a constant, defining $\lambda d1+k$, $\lambda d2+k$, . . . and $\lambda dn+k$ ($1 \leqq k < n$) as wavelengths of downstream optical signals that are transferred along the redundant optical fiber to the ONUs, and

when $\lambda u1$, $\lambda u2$, . . . and λun are defined as wavelengths of upstream optical signals that are transferred along the current-optical fiber and correspond to the ONUs, and when a wavelength interval is a constant, defining $\lambda u1+k$, $\lambda u2+k$, . . . and $\lambda un+k$ (k is an integer of one or greater) as wavelengths of upstream optical signals that are transferred along the redundant optical fiber to the ONUs.

27. (Previously Presented) The optical wavelength division multiplexing access system according to claim 26, wherein,

replacing $\lambda dn + i$ with λdi when $\lambda dn + i = \lambda di + FSR$ is established; and

replacing $\lambda un + i$ with λui when $\lambda un + i = \lambda ui + FSR$ is established (i is an integer of 1 to k).

28. (Previously Presented) The optical wavelength division multiplexing access system according to claim 26, wherein the device for oscillating the optical carriers, having wavelengths λu1 to λun, that are used for upstream signals, and the device for oscillating the optical carriers, having wavelengths λu1+k to λun+k, that are used for upstream signals, are constituted by one device for oscillating optical carriers having wavelengths λu1 to λun+k; and the optical carriers having wavelengths λu1 to λun+1, used for upstream signals, are transmitted to the downstream current-use optical fiber and the downstream redundant optical fiber.

29. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein the transmission device includes:

n current-use optical transmitters and n reserve optical transmitters, for transmitting downstream optical signals having wavelengths λdw1 to λdwn and downstream optical signals having wavelengths λdp1 to λdpn,

a downstream current-use wavelength multiplexing unit, having n ports to be connected to the n current-use optical transmitters and one port to be connected to the downstream current-use optical fiber, and

a downstream reserve wavelength multiplexing unit, having n ports to be connected to the n reserve optical transmitters and one port to be connected to the downstream optical fiber;

the downstream optical signals having wavelengths λdw1 to λdwn, which are received from the n current-use optical transmitters and are multiplexed by the

downstream current-use wavelength multiplexing unit, and a resultant signal is output to the downstream current-use optical fiber;

the downstream optical signals having wavelengths λdp1 to λdpn, which are received from the n reserve optical transmitters, are multiplexed by the downstream reserve wavelength multiplexing unit, and a resultant signal is output to the downstream redundant optical fiber; and

the current-use and reserve optical transmitters include devices for selecting the presence/absence of an optical output in accordance with a selection signal received from the supervisory control unit.

30. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein the transmission device includes:

n current-use optical transmitters and n reserve optical transmitters, for transmitting downstream optical signals having wavelengths λdw1 to λdwn and downstream optical signals having wavelengths λdp1 to λdpn,

n downstream current-use optical switches, for setting ON or OFF for the output of received optical signals,

a downstream current-use multiplexing unit, having n ports to be connected to the n downstream current-use optical switches and one port to be connected to the downstream current-use optical fiber,

n downstream reserve optical switches, for setting ON or OFF for the input of received optical switches, and

a downstream reserve multiplexing unit, having n ports to be connected to the n downstream reserve optical switches and one port to be connected to the downstream redundant optical fiber;

the downstream optical signals transmitted by the current-use optical transmitters and the reserve optical transmitters are received by the optical switches, and outputs of the optical switches are selected in accordance with a selection signal transmitted by the supervisory control unit;

the downstream optical signals having wavelengths λdw1 to λdwn, output by the n current-use optical switches, are multiplexed by the downstream current-use multiplexing unit and a resultant signal is output to the downstream current-use optical fiber;

the downstream optical signals having wavelengths λdp1 to λdpn, output by the n reserve optical switches, are multiplexed by the downstream reserve multiplexing unit and a resultant signal is output to the downstream current-use optical fiber; and

when the downstream current-use optical fiber is employed for transmission of downstream optical signals to the ONUs, the downstream optical signals having wavelengths λdw1 to λdwn, corresponding to the ONUs, are multiplexed, and when the downstream redundant optical fiber is employed for transmission, the downstream optical signals having wavelengths λdp1 to λdpn, corresponding to the ONUs, are multiplexed, so that the transmission is performed by selecting either the downstream current-use optical fiber, or the downstream redundant optical fiber.

31. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein the transmission device includes:

n current-use optical transmitters for, upon receiving downstream electric signals, transmitting downstream optical signals having wavelengths λdw1 to λdwn, and n reserve optical transmitters, for, upon receiving downstream electric signals, transmitting downstream optical signals having wavelengths λdp1 to λdpn,

a downstream current-use multiplexing unit, having n ports to be connected to the n current-use optical transmitters and one port to be connected to a downstream current-use optical switch,

a downstream reserve multiplexing unit, having n ports to be connected to the n reserve optical transmitters and one port to be connected to a downstream reserve optical switch,

one downstream current-use optical switch, for setting ON/OFF for the output of a multiplexed downstream optical signal received from the downstream current-use multiplexing unit, and

one downstream current-use optical switch, for setting ON/OFF for the output of a multiplexed downstream optical signal received from the downstream reserve multiplexing unit;

the downstream current-use optical signals having wavelengths λdp1 to λdwn, output by the n current-use optical transmitters, are multiplexed by the downstream current-use multiplexing unit and a resultant signal is output to the downstream current-use optical switch;

the downstream reserve optical signals having wavelengths λdp1 to λdpn, output by the n reserve optical transmitters, are multiplexed by the downstream reserve multiplexing unit and a resultant signal is output to the downstream reserve optical switch; and

either a current-use optical fiber or a redundant optical fiber to be used for output is selected in accordance with a selection signal transmitted by the supervisory control unit.

32. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein a wavelength λdpk (k = 1 to n) is set as λdwk + Δλd (k = 1 to n; Δλd is a constant value);

the transmission device includes:

n current-use optical transmitters and n reserve optical transmitters for, upon receiving downstream electric signals, outputting downstream optical signals having wavelengths λdw1 to λdwn and downstream optical signals having wavelengths λdp1 to λdpn,

n optical switches, used to select the current-use optical transmitters that transmit a downstream optical signal having wavelength λdwk (k is an integer of one or greater to n or smaller), or the reserve optical transmitters that transmit a downstream optical signal having wavelength λdpk (k is an integer of one or greater to n or smaller), and

a downstream array waveguide diffraction grating (downstream AWG), having n ports to be connected to the n optical switches and two ports to be connected to the downstream current-use optical fiber and the redundant optical fiber; and

the downstream optical signals having wavelength λdwk and wavelength λdpk are transmitted from the current-use optical transmitters to the optical switches, either the downstream optical signal having wavelength λdwk or wavelength λdpk is selected and output by the n optical switches to the downstream AWG, and in accordance with the downstream optical signal having the selected wavelength, the downstream current-use optical fiber or the downstream redundant optical fiber is employed to multiplex and output the resultant signal.

33. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein a wavelength λdpk (k = 1 to n) is set as λdwk + ΔλD (k = 1 to n; Δλd is a constant value);

the transmission device includes:

n current-use optical transmitters for selecting and transmitting downstream signals having either wavelength λdwk (k is an integer of one or greater to n or smaller) or wavelength λdpk (k is an integer of one or greater or n or smaller), and

a downstream array waveguide diffraction grating (downstream AWG), having n ports to be connected to the n optical transmitters and two ports to be connected to the downstream current-use optical fiber and the redundant optical fiber;

the downstream optical signals having wavelength λdwk (k is an integer of one or greater to n or smaller) or wavelength λdpk (k is an integer of one or greater to n or

smaller) are selected in accordance with a selection signal received from the supervisory control unit and are output by the optical transmitters; and

the downstream AWG multiplexes and outputs an obtained signal along the downstream optical fiber or the downstream redundant optical fiber that is consonant with the downstream optical signals having the selected wavelength.

34. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein transmission device includes:

n current-use optical receivers, for converting received upstream optical signals having wavelengths λuw1 to λuwn into upstream electric signals and outputting the upstream electric signals, and n reserve optical receivers, for converting received upstream optical signals having wavelengths λup1 to λupn into upstream electric signals and for outputting the upstream electric signals,

an upstream current-use demultiplexing unit, having n ports to be connected to the n current-use optical receivers and one port to be connected to the upstream current-use optical fiber, and

an upstream reserve demultiplexing unit, having n ports to be connected to the n reserve optical receivers and one port to be connected to the upstream reserve fiber;

the upstream optical signals received along the upstream current-use optical fiber are divided by the upstream current-use demultiplexing unit and transmitted to the current-use optical receivers;

the upstream optical signals received along the upstream redundant optical fiber are divided by the upstream demultiplexing unit and transmitted to the reserve optical receivers; and

upstream electric signals to be output are selected in accordance with a selection signal transmitted by the supervisory control unit.

35. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein the transmission device includes:

n current-use optical receivers, for converting received upstream optical signals having wavelengths λuw1 to λuwn into upstream electric signals and outputting the upstream electric signals, and n reserve optical receivers, for converting received upstream optical signals having wavelengths λup1 to λupn into upstream electric signals and for outputting the upstream electric signals,

an upstream current-use demultiplexing unit, having n ports to be connected to the n current-use optical receivers and one port to be connected to the upstream current-use optical fiber,

an upstream reserve demultiplexing unit, having n ports to be connected to the n reserve optical receivers and one port to be connected to the upstream reserve fiber,

one upstream current-use optical switch, used to set ON/OFF for the output, to the upstream current-use demultiplexing unit, of upstream optical signals received from the upstream current-use demultiplexing unit, and

one upstream reserve optical switch, used to set ON/OFF for the output, to the upstream reserve demultiplexing unit, of upstream optical signals received from the upstream reserve demultiplexing unit;

when the upstream current-use optical switch and the upstream reserve optical switch are set to ON or OFF in accordance with a selection signal received from the supervisory control unit, either a multiplexed upstream optical signal, transmitted along the upstream current-use optical fiber, or a multiplexed upstream signal, transmitted along the upstream redundant optical fiber, is selected and is output to the upstream current-use demultiplexing unit or the upstream reserve demultiplexing unit, and signals obtained by the demultiplexing unit are transmitted to the current-use optical receivers or the reserve optical receivers.

36. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein transmission device includes:

n current-use optical receivers, for converting received upstream optical signals having wavelengths λuw1 to λuwn into upstream electric signals and outputting the upstream electric signals, and n reserve optical receivers, for converting received upstream optical signals having wavelengths λup1 to λupn into upstream electric signals and for outputting the upstream electric signals,

an upstream current-use demultiplexing unit, having n ports to be connected to the n current-use optical receivers and one port to be connected to the upstream current-use optical fiber,

an upstream reserve demultiplexing unit, having n ports to be connected to the n reserve optical receivers and one port to be connected to the upstream reserve fiber,

n upstream current-use optical switches, used to set ON/OFF for the output, to the upstream current-use demultiplexing unit, of upstream optical signals received from the upstream current-use demultiplexing unit, and

n upstream current-use optical switches, used to set ON/OFF for the output, to the upstream current-use demultiplexing unit, of upstream optical signals received from the upstream current-use demultiplexing unit;

a multiplexed upstream optical signal transmitted to the upstream current-use demultiplexing unit along the upstream current-use fiber is demultiplexed and obtained signals are output to the upstream current-use optical switches;

a multiplexed upstream optical signal transmitted to the upstream reserve demultiplexing unit along the upstream reserve fiber is demultiplexed and obtained signals are output to the upstream reserve optical switches; and

when the upstream current-use optical switches or the upstream reserve optical switches are set to ON/OFF in accordance with a selection signal received from the supervisory control unit, the upstream current-use demultiplexing unit or the upstream reserve demultiplexing unit is selected and signals are transmitted to the current-use optical receivers or the reserve optical receivers.

37. (Previously Presented) The optical wavelength division multiplexing access system according to claim 13, wherein a wavelength λupk (k = 1 to n) is set as λuwk + Δλu (k = 1 to n; Δλu is a constant value);

the transmission device includes:

optical transmitters for selecting and outputting upstream optical signals having either wavelength λuwk (k is an integer of one or greater to n or smaller) or wavelength λupk (k is an integer of one or greater or n or smaller),

n optical receivers, for converting, into electric signals, received upstream optical signals having either wavelengths λuw1 to λuwn, or wavelengths λup1 to λupn, and outputting the electric signals, and

an upstream array waveguide diffraction grating (upstream AWG), having two ports to be connected to the upstream current-use optical fiber and the redundant optical fiber and n ports to be connected to the n optical receivers;

the upstream optical signal having wavelength λuwk (k is an integer of one or greater to n or smaller) or wavelength λupk (k is an integer of one or greater to n or smaller), which has been selected in accordance with a selection signal received from the supervisory control unit, is transmitted to the W-MULDEM unit; and

the W-MULDEM unit outputs the upstream optical signal to the current-use optical fiber or the redundant optical fiber that is consonant with the wavelength, and the upstream AWG demultiplexes the upstream optical signal and transmits the obtained signals to the optical receivers.

38. (Previously Presented) The optical wavelength division multiplexing access system according to claim 37, wherein the OSU includes:

a device for oscillating optical carriers having wavelengths λuw1 to λuwn, which are used for upstream signals, so as to permit the ONUs to generate upstream optical signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream current-use optical fiber, and

n optical transmitters, for selecting and outputting an upstream optical signal having wavelength λuwk (k is an integer of one or greater to n or smaller) or wavelength λupk (k is an integer of one or greater to n or smaller), and an upstream signal AWG, having two ports to be connected to the current-use optical fiber and the redundant optical fiber and n ports to be connected to the optical transmitters, both of the optical transmitters and the upstream signal AWG being provided as a device for oscillating optical carriers having wavelengths λup1 to λupn, that are used for upstream signals, so as to permit the ONUs to generate upstream optical signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream redundant optical fiber;

the upstream optical signal, which has wavelength λuwk (k is an integer of one or greater to n or smaller) or wavelength λupk (k is an integer of one or greater to n or smaller), is output by the upstream signal AWG to either the current-use optical fiber or the redundant optical fiber, which is consonant with a selection signal transmitted by the supervisory control unit, and is multiplexed with a downstream optical signal and the resultant signal is transmitted to the wavelength multiplexer.

39. (Previously Presented) The optical wavelength division multiplexing access system according to claim 38, wherein the optical transmitters add, to downstream signals, a selection signal transmitted by the supervisory control unit and transmit the obtained signals to the ONUs.

40. (Previously Presented) An optical wavelength division multiplexing access system, whereby a center node (OSU) and n optical network units (ONUs) are arranged by using a W-MULDEM unit, whereby a multiplexing section between the OSU and the W-MULDEM unit established by extending a downstream current-use optical fiber, an upstream current-use optical fiber, a downstream redundant optical fiber and an upstream redundant optical fiber, and access sections between the W-MULDEM unit and the individual ONUs are established by extension of downstream optical fibers and upstream optical fibers, whereby downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed using wavelengths that are allocated to individual ONUs and resultant signals are transmitted across the multiplexing section, and whereby the W-MULDEM unit performs wavelength multiplexing or wavelength division for the upstream or downstream optical signals to provide bidirectional transmission,

the OSU includes:

transmission device for multiplexing downstream optical signals having wavelengths λdw1 to λdwn that correspond to the ONUs and that are to be transmitted to the ONUs along the downstream current-use optical fiber, for multiplexing downstream optical signals having wavelengths λdp1 to λdpn that correspond to the

ONUs and that are to be transmitted to the ONUs along the downstream redundant optical fiber, and for selecting either the downstream current-use optical fiber or the downstream redundant optical fiber for use for transmission, and

reception device for receiving upstream optical signals having wavelengths λuw1 to λuwn along the upstream current-use optical fiber or for receiving upstream optical signals having wavelengths λup1 to λupn along the upstream redundant optical fiber;

the individual ONUs receive corresponding downstream optical signals having wavelengths λdw1 to λdwn or corresponding downstream optical signals having wavelengths λdp1 to λdpn, which are received along the optical fibers extended across the access sections, and transmit, to the optical fibers extended across the access sections, corresponding upstream optical signals that have wavelengths λuw1 to λuwn and are to be transmitted along the upstream current-use optical fiber extended across the multiplexing section, or corresponding upstream optical signals that have wavelengths λup1 to λupn and are to be transmitted along the upstream redundant optical fiber;

the W-MULDEM unit includes:

a downstream current-use demultiplexing unit corresponding to the downstream current-use optical fiber, and a downstream reserve demultiplexing unit corresponding to the downstream redundant optical fiber,

n wavelength group coupling filters for multiplexing, for corresponding ports, downstream optical signals having wavelengths λdw1 to λdwn, which have been demultiplexed by the current-use demultiplexing unit, and downstream optical signals

having wavelengths λdp1 to λdpn, which have been demultiplexed by the downstream reserve demultiplexing unit, and for outputting obtained signals to the downstream optical fibers that correspond to the ONUs,

an upstream current-use multiplexing unit corresponding to the upstream current-use optical fiber and an upstream reserve multiplexing unit corresponding to the upstream redundant optical fiber, and

n wavelength group demultiplex filters, for dividing and transmitting, to corresponding ports of the upstream current-use multiplexing unit or the upstream reserve multiplexing unit, the upstream optical signals having wavelengths λuw1 to λuwn and having wavelengths λup1 to λupn, all of which are received from the upstream optical fibers corresponding to the ONUs;

wherein the downstream optical signals having wavelengths λdw1 to λdwn, which are received along the downstream current-use optical fiber, or the downstream optical signals having wavelengths λdp1 to λdpn, which are received along the downstream redundant optical fiber, are divided into ports corresponding to the ONUs;

the upstream optical signals having wavelengths λuw1 to λuwn, or the upstream optical signals having wavelengths λup1 to λupn, which are received from the upstream optical fibers corresponding to the ONUs, are merged at the port that corresponds to the upstream current-use optical fiber or the upstream redundant optical fiber; and

different bands are provided for the wavelengths λdw1 to λdwn of the downstream current-use optical signals and the wavelengths λuw1 to λuwn of the downstream reserve optical signals, and different bands are provided for the

wavelengths λuw1 to λuwn of the upstream current-use optical signals and the wavelengths λup1 to λupn of the upstream reserve optical signals.

41. (Previously Presented) The optical wavelength division multiplexing access system according to claim 40, wherein wavelengths of downstream current-use optical signals that correspond to the ONUs are equalized with wavelengths of upstream reserve optical signals, and wavelengths of upstream current-use optical signals are equalized with wavelengths of downstream reserve optical signals.

42. (Previously Presented) An optical wavelength division multiplexing access system, whereby a center node (OSU) and n optical network units (ONUs) are arranged by using a W-MULDEM unit, whereby a multiplexing section between the OSU and the W-MULDEM unit is established by extending a downstream current-use optical fiber, an upstream current-use optical fiber, a downstream redundant optical fiber and an upstream redundant optical fiber, and access sections between the W-MULDEM unit and the individual ONUs are established by the extension of downstream optical fibers and upstream optical fibers, whereby downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed using wavelengths that are allocated to individual ONUs and the resultant signals are transmitted across the multiplexing section, and whereby the W-MULDEM unit performs wavelength multiplexing or wavelength division for the upstream or downstream optical signals to provide bidirectional transmission, wherein

the OSU includes:

transmission device for, when the ONUs are divided into two groups, #1 to #k and #k+1 to #n, and downstream optical signals are divided into two wavelength groups, λd1 to λdk and λdk+1 to λdn, multiplexing downstream optical signals having wavelengths λd1 to λdk so as to transmit downstream optical signals to the ONUs #1 to #k along the downstream current-use optical fiber, for multiplexing downstream optical signals having wavelengths λdk+1 to λdn for transmission along the downstream redundant optical fiber to the ONUs #1 to #k, for multiplexing downstream optical signals having wavelengths λdk+1 to λdn so as to transmit downstream optical signals to the ONUs #k+1 to #n along the downstream current-use optical fiber, and for multiplexing downstream optical signals having wavelengths λd1 to λdk for transmission along the downstream redundant optical fiber to the ONUs #k+1 to #n, so that either the downstream current-use optical fiber or the downstream redundant optical fiber is selected for transmission, and

reception device for, when upstream optical signals are divided into two wavelength groups, λu1 to λuk and λuk+1 to λun, receiving upstream optical signals, for which wavelengths λu1 to λuk for current use and wavelengths λuk+1 to λun for reserve use are allocated for the ONUs #1 to #k, and for which wavelengths λuk+1 to λun for current use and wavelengths λu1 to λuk for reserve use are allocated for the ONUs #k+1 to #n;

the ONUs receive, along the downstream optical fibers at the access sections, downstream optical signals having corresponding wavelengths λd1 to λdk, or wavelengths λdk+1 to λdn, and transmit, to the upstream optical fibers, upstream optical signals having corresponding wavelengths λu1 to λuk when the upstream current-use

optical fiber at the multiplexing section is employed for transmission, or transmit upstream optical signals having corresponding wavelengths λuk+1 to λun when the upstream redundant optical fiber is employed for transmission;

the W-MULDEM unit includes:

two ports to be connected to the downstream current-use optical fiber and the downstream redundant optical fiber,

a downstream current-use demultiplexing unit corresponding to the downstream current-use optical fiber and a downstream reserve demultiplexing unit corresponding to the downstream redundant optical fiber,

n wavelength group coupling filters, for multiplexing, for the ndividual ports, the downstream optical signals having wavelengths λd1 to λdk and λdk+1 to λdn, which have been demultiplexed by the downstream current-use demultiplexing unit, and the downstream optical signals having wavelengths λdk+1 to λdn and λd1 to λdk, which have been demultiplexed by the downstream reserve demultiplexing unit, and for transmitting obtained signals to the upstream current-use optical fiber and the upstream redundant optical fiber,

two ports to be connected to the upstream current-use optical fiber and the upstream redundant optical fiber,

an upstream current-use multiplexing unit corresponding to the upstream current-use optical fiber and an upstream reserve multiplexing unit corresponding to the upstream redundant optical fiber, and

n wavelength group demultiplex filters, for dividing the upstream optical signals having wavelengths λu1 to λuk and λuk+1 to λun and wavelengths λuk+1 to λun

and λu1 to λuk, which are received along the upstream optical fiber corresponding to the ONUs, and outputting the signals to the corresponding ports of the upstream current-use multiplexing unit or the upstream reserve multiplexing unit; and

the downstream optical signals having wavelengths λd1 to λdn, which are received along the downstream current-use optical fiber or the downstream redundant optical fiber, are divided among the ports corresponding to the ONUs, and the upstream optical signals having wavelengths λu1 to λun, which are received along the upstream optical fibers corresponding to the ONUs, are multiplexed at the port that corresponds to the upstream current-use optical fiber or the redundant optical fiber.

43. (Previously Presented) An optical wavelength division multiplexing access system, whereby a center node (OSU) and n optical network units (ONUs) are arranged by using a W-MULDEM unit, whereby a multiplexing section between the OSU and the W-MULDEM unit is established by extending a downstream current-use optical fiber, an upstream current-use optical fiber, a downstream redundant optical fiber and an upstream redundant optical fiber, and access sections between the W-MULDEM unit and the individual ONUs are established by the extension of downstream optical fibers and upstream optical fibers, whereby downstream optical signals from the OSU to the ONUs and upstream optical signals from the ONUs to the OSU are multiplexed using wavelengths that are allocated to individual ONUs and the resultant signals are transmitted across the multiplexing section, and whereby the W-MULDEM unit performs wavelength multiplexing or wavelength division for the upstream or downstream optical signals to provide bidirectional transmission, wherein

the OSU includes:

transmission device for multiplexing downstream optical signals having wavelengths λdw1 to λdwn that correspond to the ONUs and that are to be transmitted to the ONUs along the downstream current-use optical fiber,for multiplexing downstream optical signals having wavelengths λdp1 to λdpn that correspond to the ONUs and that are to be transmitted to the ONUs along the downstream redundant optical fiber, and for selecting either the downstream current-use optical fiber or the downstream redundant optical fiber for use for transmission,

reception device for receiving upstream optical signals having wavelengths λuw1 to λuwn along the upstream current-use optical fiber or for receiving upstream optical signals having wavelengths λup1 to λupn along the upstream redundant optical fiber,

a device for oscillating optical carriers, having wavelengths λuw1 to λuwn, which are used by the ONUs for generation of upstream signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream current-use optical fiber, and

a device for oscillating optical carriers, having wavelengths λup1 to λupn, which are used by the ONUs for generation of upstream signals, and for multiplexing the optical carriers and transmitting a resultant carrier to the downstream redundant optical fiber;

the individual ONUs receive corresponding downstream optical signals having wavelengths λdw1 to λdwn or corresponding downstream optical signals having wavelengths λdp1 to λdpn, which are received along the optical fibers extended across

the access sections, and transmit, to the optical fibers extended across the access sections, corresponding upstream optical signals that have wavelengths λuw1 to λuwn and are to be transmitted along the upstream current-use optical fiber extended across the multiplexing section, or corresponding upstream optical signals that have wavelengths λup1 to λupn and are to be transmitted along the upstream redundant optical fiber;

the W-MULDEM unit includes:

a downstream array waveguide diffraction grating (downstream AWG), having two ports to be connected to the downstream current-use optical fiber and the downstream redundant optical fiber and n ports to be connected to the downstream optical fibers corresponding to the ONUs,

an upstream array waveguide diffraction grating (upstream AWG), having two ports to be connected to the upstream current-use optical fiber and the upstream redundant optical fiber and n ports to be connected to the upstream optical fibers corresponding to the ONUs,

two wavelength group demultiplex filters, for demultiplexing optical carriers having wavelengths λuw1 to λuwn, which are used for upstream signals, from downstream optical signals having wavelengths λdw1 to λdwn, which are received along the downstream current-use optical fiber, and for demultiplexing optical carriers having wavelengths λup1 to λupn, which are used for upstream signals, from downstream optical signals having wavelengths λdp1 to λdpn, which are received along the downstream redundant optical fiber,

an upstream signal optical carrier AWG, for dividing the optical carriers, which have wavelengths λuw1 to λuwn and are used for upstream signals, among the ports corresponding to the ONUs, and

n wavelength group coupling filters, for multiplexing the downstream optical signals, which have been demultiplexed by the downstream AWG, and the optical carriers, used for upstream signals, which have been demultiplexed by the upstream signal optical carrier AWG, and for transmitting the resultant signals to the downstream optical fibers corresponding to the ONUs;

the downstream optical signals having wavelengths λdw1 to λdwn, which are transmitted along the downstream current-use optical fiber to the downstream AWG, or the downstream optical signals having wavelengths λdp1 to λdpn, which are transmitted along the downstream redundant optical fiber, are divided among the ports corresponding to the ONUs; and

the upstream optical signals having wavelengths λuw1 to λuwn or wavelengths λup1 to λupn, which are transmitted to the upstream AWG along the upstream current-use optical fibers corresponding to the ONUs, are merged at the port corresponding to the upstream current-use optical fiber or the upstream redundant optical fiber.

44. (Previously Presented) The optical wavelength division multiplexing access system according to claim 43, wherein

providing, instead of the upstream signal optical carrier AWG, an upstream current-use signal optical carrier AWG corresponding to the downstream current-use optical fiber and an upstream reserve signal optical carrier AWG corresponding to the

downstream redundant optical fiber, and n wavelength group coupling filters for multiplexing, for individual ports, the upstream signal optical carriers having wavelengths λuw1 to λdwu, which have been demultiplexed by the upstream current-use signal optical carrier AWG, and the upstream signal optical carriers having wavelengths λup1 to λupn, which have been demultiplexed by the upstream reserve signal optical carrier AWG;

providing, instead of the downstream AWG, a downstream current-use AWG corresponding to the downstream current-use optical fiber and a downstream reserve AWG corresponding to the downstream redundant optical fiber, and n wavelength group coupling filters, for multiplexing, for individual ports, the downstream optical signals having wavelengths λdw1 to λdwn, which have been demultiplexed by the downstream current-sue AWG, and the downstream optical signals having wavelengths λdp1 to λdpn, which have been demultiplexed by the downstream reserve AWG; and

providing, instead of the upstream AWG, an upstream current-use AWG corresponding to the upstream current-use optical fiber and an upstream reserve AWG corresponding to the upstream redundant optical fiber, and n wavelength group demultiplex filters, for dividing the upstream optical signals having wavelengths λuw1 to λuwn and wavelengths λup1 to λupn, which are received along the upstream optical fibers corresponding to the ONUs, and for transmitting resultant signals to corresponding ports of the upstream current-use AWG or the reserve AWG.

45. (Previously Presented) The optical wavelength division multiplexing access system according to claim 43, wherein

the ONUs are divided into two groups, #1 to #k and #k+1 to #n; and

when dividing downstream optical signals into two wavelength groups, λd1 to λdk and λdk+1 to λdn, allocating current-use wavelengths λd1 to λdk and reserve wavelengths λdk+1 to λdn for the ONUs #1 to #k, and allocating current-use wavelengths λdk+1 to λdn and reserve wavelengths λd1 to λdk for the ONUs #k+1 to #n;

when dividing upstream optical signals into two wavelength groups, λu1 to λuk and λuk+1 to λun, allocating current-use wavelengths λu1 to λuk and reserve wavelengths λuk+1 to λun for the ONUs #1 to #k, and allocating current-use wavelengths λuk+1 to λun and reserve wavelengths λu1 to λuk for the ONUs #k+1 to #n;

providing, instead of the upstream signal optical carrier AWG, an upstream current-use signal optical carrier demultiplexing unit that corresponds to the downstream current-use optical fiber and an upstream reserve signal optical carrier demultiplexing unit that corresponds to the downstream redundant optical fiber, and n wavelength group coupling filters, for multiplexing, for individual ports, upstream signal optical carriers having wavelengths λu1 to λuk and λuk+1 to λun, which have been demultiplexed by the upstream current-use signal optical carrier demultiplexing unit, and upstream signal optical carriers having wavelengths λuk+1 to λun and λu1 to λuk, which have been demultiplexed by the upstream reserve signal optical carrier demultiplexing unit;

providing, instead of the downstream AWG, a downstream current-use demultiplexing unit that corresponds to the downstream current-use optical fiber and a

downstream reserve demultiplexing unit that corresponds to the downstream redundant optical fiber, and n wavelength group coupling filters for multiplexing, for individual ports, downstream optical signals having wavelengths λd1 to λdk and λdk+1 to λdn, which have been demultiplexed by the downstream current-use demultiplexing unit, and downstream optical signals having wavelengths λdk+1 to λdn and λd1 to λdk, which have been demultiplexed by the downstream reserve demultiplexing unit; and

providing, instead of the upstream AWG, an upstream current-use multiplexing unit that corresponds to the upstream current-use optical fiber and an upstream reserve multiplexing unit that corresponds to the upstream redundant optical fiber, and n wavelength group demultiplex filters, for demultiplexing upstream optical signals having wavelengths λu1 to λuk and λuk+1 to λun and wavelengths λuk+1 to λun and λu1 to λuk, which are received along the upstream optical fibers corresponding to the ONUs, and for transmitting resultant signals to corresponding ports of the upstream current-use multiplexing unit or the upstream reserve multiplexing unit.

46. (Cancelled)